CLAIMS

1. An etching solution comprised of a solution based on cupric chloride and a triazole type compound added to the cupric chloride solution.

2. The etching solution according to claim 1, wherein the triazole type compound is at least one selected from among benzotriazole (BTA), BTA-COOH and tolyl triazole (TTA).

3. The etching solution according to claim 1, wherein the concentration of the triazole type compound is over 1000 ppm and under 3000 ppm.

4. The etching solution according to claim 1, wherein the concentration of the triazole type compound is in a range of 1200 to 2500 ppm.

5. The etching solution according to any one of claims 1 to 4, containing at least either amphoteric surface active agent or anionic surface active agent.

6. The etching solution according to claim 5, wherein the amphoteric surface active agent is at least one selected from among carboxy betaine type alkyl betaine (alkyldimethyl betaine aminoacetate, alkyldimethyl betaine acetate, alkyldimetyl carboxymethyl betaine, alkyldimethyl carboxymethylene ammonium betaine and alklydimethyl ammoniumacetate), and fatty amide propyl betaine (fatty amide propyl dimethyl betaine aminoacetate, alkyl amide propyl betaine, alkyloyl amide propyl dimethyl glycine, alkanoyl aminopropyl dimethyl ammonium acetate, palm oil fatty amide propyl betaine and palm oil fatty amide propyl dimethyl betaine aminoacetate).

7. The etching solution according to claim 5, wherein the anionic surface active agent is at least one selected from among alcohol ethoxylate [AE](polyoxyethylene alkyl ether and alkyl polyoxyethylene ether),

polyoxyethylene (polyoxyethylene polyoxypropylene), polyoxypropylene glycol (polyoxyethylene polyoxypropylene glycol ether, polypropylene glycol polyethylene glycol ether and polyoxyalkylene block polymer), Fatty polyethylene glycol (acyl polyethylene glycol, polyethylene glycol fatty acid ester, polyoxyethylene glycol fatty acid ester, PEG fatty acid ester, polyoxyethylene alkanoate [alkanoate] and alkyl carbonyl oxypolyoxyethylene) and fatty polyoxyethylene sorbitan (acyl polyoxyethylene sorbitan, polyoxyethylene sorbitan [mono - tri], alkanoate , polyoxyethylene hexythane fatty acid ester, sorbitan fatty acid fatty acid ester polyethylene glycol ether and POE sorbitan [mono - tri] fatty acid ester [polysorbate]).

8. The etching solution according to claim 5, wherein the concentration of the amphoteric surface active agent or anionic surface active agent is within a range of 2000 to 11000 ppm.

9. The etching solution according to claim 5, wherein the concentration of the amphoteric surface active agent or anionic surface active agent is within a range of 4000 to 9700 ppm.

10. An etching method of etching a copper layer coated with an etching resist having a predetermined pattern using an etching solution, wherein:

an etching solution or etching solution droplet comprised of a solution based on cupric chloride and a triazole type compound added to the cupric chloride solution is supplied to parts of the copper layer exposed between traces of the etching resist pattern; and

the copper layer parts not covered with the etching resist are etched while an etching-inhibiting coating is selectively formed on the copper layer part laid under edges of the etching resist.

11. An etching method of etching a copper layer coated with an etching resist having a predetermined pattern using an etching solution, wherein an etching solution comprised of a solution based on cupric chloride and a triazole type compound and at least either amphoteric or anionic surface active agent added to the cupric chloride solution is supplied to parts of the copper layer exposed between traces of the etching resist pattern, and the copper layer parts not covered with the etching resist are etched while an etching-inhibiting coating is selectively formed on the copper layer part laid under the edge of the etching resist.

12. The etching method according to claim 10, wherein the triazole type compound is at least one selected from among benzotriazole (BTA), BTA-COOH and tolyl triazole (TTA).

13. The etching method according to claim 10, wherein the concentration of the triazole type compound is over 1000 ppm and under 3000 ppm.

14. The etching method according to claim 10, wherein the concentration of the triazole type compound is in a range of 1200 to 2500 ppm.

15. The etching method according to claim 11, wherein the amphoteric surface active agent is at least one selected from among carboxy betaine type alkyl betaine (alkyldimethyl betaine aminoacetate, alkyldimethyl betaine acetate, alkyldimetyl carboxymethyl betaine, alkyldimethyl carboxymethylene ammonium betaine and alklydimethyl ammoniumacetate), and fatty amide propyl betaine (fatty amide propyl dimethyl betaine aminoacetate, alkyl amide propyl betaine, alkyloyl amide propyl dimethyl glycine, alkanoyl aminopropyl dimethyl ammonium acetate, palm oil fatty amide propyl betaine and palm oil fatty amide propyl dimethyl betaine aminoacetate).

16. The etching method according to claim 11, wherein the anionic surface

active agent is at least one selected from among alcohol ethoxylate [AE](polyoxyethylene alkyl ether and alkyl polyoxyethylene ether), polyoxyethylene (polyoxyethylene polyoxypropylene), polyoxypropylene glycol (polyoxyethylene polyoxypropylene glycol ether, polypropylene glycol polyethylene glycol ether and polyoxyalkylene block polymer), Fatty polyethylene glycol (acyl polyethylene glycol, polyethylene glycol fatty acid ester, polyoxyethylene glycol fatty acid ester, PEG fatty acid ester, polyoxyethylene alkanoate [alkanoate] and alkyl carbonyl oxypolyoxyethylene) and fatty polyoxyethylene sorbitan (acyl polyoxyethylene sorbitan, polyoxyethylene sorbitan [mono - tri], alkanoate , polyoxyethylene hexythane fatty acid ester, sorbitan fatty acid fatty acid ester polyethylene glycol ether and POE sorbitan [mono - tri] fatty acid ester [polysorbate]).

17. The etching method according to claim 11, wherein the concentration of the amphoteric surface active agent or anionic surface active agent is within a range of 2000 to 11000 ppm.

18. The etching solution according to claim 11, wherein the concentration of the amphoteric surface active agent or anionic surface active agent is within a range of 4000 to 9700 ppm.

19. A printed wiring board having a circuit pattern formed by the etching method according to any one of claims 10 to 18, wherein on the side wall of the circuit pattern, there are formed nonuniform irregularities having a shape and size that depend upon the concentration of the triazole type compound added to the etching solution, concentration of the surface active agent or spray pressure of the etching solution.

20. The printed wiring board according to claim 19, wherein the nonuniform

irregularities are comprised of primary depressions including many convexities extending irregularly from the surface of the circuit pattern toward the surface of a substrate and concavities existing between the convexities, and secondary depressions including smaller irregularities existing between the concavities and convexities included in the primary depressions.

21. The printed wiring board according to claim 20, wherein:

the pitch of the primary depressions is 5 to 20 μm; and

the depth of the primary depressions is 5 to 15 μm.

22. The printed wiring board according to claim 20, wherein the depth of the secondary depressions is 1/10 to 1/2 of the depth of the primary depressions.